

## CLAIMS

1) Protein constituting a mammalian neuronal cationic channel that is sensitive to amiloride and activated by protons.

2) Protein according to claim 1, the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: ~~1~~<sup>2</sup> or a functionally equivalent derivative of this protein.

3) Protein according to one of claims 1 or 2, the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: ~~2~~<sup>3</sup> or a functionally equivalent derivative of this protein.

4) Protein according to one of claims 1 or 2, the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: ~~3~~<sup>66</sup> or a functionally equivalent derivative of this protein.

5) Protein according to claim 1, the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: ~~4~~<sup>32</sup> or a functionally equivalent derivative of this protein.

6) Protein according to claim 1, the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: ~~5~~<sup>10</sup> or a functionally equivalent derivative of this protein.

7) Hybrid cationic channel constituted by the combination of a first protein constituting a proton-activated ionic channel according to one of claims 1 to 6 with a second protein constituting an ionic channel that is proton activated or not proton activated.

8) Hybrid cationic channel constituted by the combination of a first protein constituting a proton-activated ionic channel according to one of claims 1 to 6 with a second protein constituting a proton-activated ionic channel according to one of claims 1 to 6.

5 9) Hybrid cationic channel according to claim 8, characterized in that said first protein is a protein the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4 or SEQ ID NO: 5, and the second protein is a protein the amino acid sequence of which is represented in the annexed list of sequences under number SEQ ID NO: 3 or SEQ ID NO: 6.

10 10) Monoclonal or polyclonal antibody directed against at least one protein according to one of claims 1 to 6 and/or against at least one hybrid channel according to one of claims 7 to 9.

Sub C6 11) Nucleic acid molecule comprising or constituted by a nucleic sequence coding for a protein constituting a cationic channel according to one of claims 1 to 6 or a hybrid channel according to one of claims 7 to 9.

Sub D6 12) Nucleic acid molecule according to claim 11, comprising or constituted by the nucleic sequence bounded by nucleotides 123 and 1700 of the sequence represented in the annexed list of sequences under number SEQ ID NO: 1 or its complementary sequence.

Sub D67  
cont. 13) Nucleic acid molecule according to claim 11, comprising or constituted by the  
AA nucleic sequence bounded by nucleotides 1 and 1542 of the sequence represented in the  
annexed list of sequences under number SEQ ID NO: 23 or its complementary sequence.

5 14) Nucleic acid molecule according to claim 11, comprising or constituted by the  
nucleic sequence bounded by nucleotides 127 and 1663 of the sequence represented in the  
AA annexed list of sequences under number SEQ ID NO: 25 or its complementary sequence.

Sub D77  
10 15) Nucleic acid molecule according to claim 11, comprising or constituted by the  
nucleic sequence bounded by nucleotides 109 and 1785 of the sequence represented in the  
AA annexed list of sequences under number SEQ ID NO: 27 or its complementary sequence.

16) Nucleic acid molecule according to claim 11, comprising or constituted by the  
nucleic sequence bounded by nucleotides 1 and 1602 of the sequence represented in the  
AA 15 annexed list of sequences under number SEQ ID NO: 29 or its complementary sequence.

Sub C7 17) Vector comprising at least one nucleic acid molecule according to one of claims 11  
to 16, advantageously combined with control sequences.

18) Method for producing a protein constituting an ionic channel according to one of claims 1 to 6 or a hybrid channel according to one of claims 7 to 9, characterized in that it comprises:

- transferring a nucleic acid molecule according to one of claims 11 to 16 or a vector according to claim 17 into a cell host,
- culturing said cell host under conditions allowing production of the protein constituting the ionic channel,
- isolating by any suitable means the proteins constituting the ionic channels.

19) Method for expressing a protein constituting an ionic channel according to one of claims 1 to 6 or a hybrid channel according to one of claims 7 to 9, characterized in that it comprises:

- transferring a nucleic acid molecule according to one of claims 11 to 16 or a vector according to claim 17 into a cell host,
- culturing said cell host under conditions allowing production of the protein constituting the ionic channel

20) Method according to one of claims 18 or 19, characterized in that the cell host is selected from among the prokaryotes or the eukaryotes and notably from among the bacteria, yeasts or cells of mammals, plants or insects.

21) Transformed cell expressing the mammalian neuronal amiloride-sensitive proton-activated cationic channels obtained by the method according to one of claims 18 to 20.

22) Method for screening substances that are capable of modulating the activity of mammalian neuronal ionic channels, characterized in that variable quantities of a substance to be tested are brought into contact with the cells according to claim 21 then, using any suitable means, one measures the possible effects of said substance on the currents of the amiloride-sensitive proton-activated cationic channels.

23) Method according to claim 22, applied to the screening of substances capable of modulating the perception of acidity, with regard to nociception as well as taste transduction.

24) Pharmaceutical composition comprising as active ingredient at least one protein constituting an ionic channel according to one of claims 1 to 6 or a hybrid channel according to one of claims 7 to 9 or an antibody according to claim 10.

25) Use of a chemical or biological substance that is capable of modifying the currents of an ionic channel according to one of claims 1 to 6 and/or a hybrid channel according to one of claims 7 to 9 for the preparation of a drug that is capable of modulating the perception of acidity, with regard to nociception as well as taste transduction, in a human or animal subject.

add C<sup>8</sup>